Lesson 96 - Corrective Exercises And Their Application

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1. Introduction

Humans were designed to live active out-of-doors lives, to forage for food, to seek shelter where it could be found and as need arose. They were structured to live among the trees and in the forest, to do physical labor for agricultural purposes, to tend to the harvest and to pick the fruit from tree and vine.

But humans were not designed to live in air-tight houses, to sit at a desk for hours on end, or to apply their minds constantly and continuously to solving multiple problems. Humans were not made to toil under electric lights or to sit passively for hours reclining in an overstuffed easy chair passively watching phantom figures flitting by on a television screen, all the while receiving multiple nerve impingements due to electrical and radiation impulses emanating from an electrical box and being transmitted through the ether.

Neither were humans designed to eat as the average person eats in today's world but, to the contrary, people were provided with certain digestive organs possessing well-defined physiological limitations and capabilities, organs made to process simple natural foods freshly gathered and served in the simplest of combinations, if combined at all.

Probably in no other country in the entire world has the available food been so altered and changed and in such a short time as in the U.S., although presently many countries of the world are fast imitating "The American Way," and reaping the same "benefits." Dr. Edmond Bordeaux Szekely in his *The Book of Living Foods* points out that, "From the starch-loaded, high-calorie fuel foods of our pioneer ancestors (who presumably needed strength to fight the Indians, who in turn won many battles eating only nuts and berries), to the "breatharians" of the 20s, ... our history has been studded with all kinds of nutritional facts and fancies."

As on many past occasions, the U.S. Government is again expressing dismay at the lack of physical fitness among children and young people in general. On all sides, even a casual observer of the current sad scene can see stuffed noses, curved spines, mouths dangling wide open, a lack of symmetry to childish bodies, sadly restricted by malaligned organs and a veritable host of encumbrances of one kind or another. Hygienists have no lack of opportunity to do their best to correct that which obviously presents a major threat to the on-going vitality of our nation.

There can be no doubt that only a full application of all known Hygienic principles and total obedience to the biodynamics of our organic existence can save the human race from extinction and return it to its former pristine and perfect form. We have strayed mightily and willfully far from the physical beauty of face and form and lack the strength of the men, women and children of ancient Greece. In no way do our children and young people bear any resemblance to the strong and straight offspring of the Mongols of northern China or even the young Romans who lived in earlier centuries; and fewer yet adults who presently possess the strength and erectness of posture evidenced by the Greek dock-workers, for instance, of Sylvester Graham's time. Flat-footed, spines curved in and out and sideways, the men and women of today's world wend their weary way with stiffened muscles and osteoporotic bones.

It will probably take many generations of Hygienic living to return the human race to some semblance of what full health and perfect form can offer. We can only imagine such a time and place. However, the correct and consistent application of corrective exercises and a Hygienic lifestyle can at least improve the lot of some individuals who might otherwise suffer either now or at some time in the future from an ailment which, in the final analysis, might well be traced back to some deviation of the physical structure from the norm, such deviation being of either major or minor importance.

In this discussion, therefore, we will simply describe certain structural malformations giving, in some instances but not in all, the possible future negative consequences vis a vis the overall health of an individual who remains thus encumbered, and then present certain corrective measures which have been found to produce salubrious results in the past and which may prove of benefit in working with a particular client.

Obviously, there can be no guarantee that existing structural defects can be altered to such an extent and in such a manner as to return the body to a perfectly-normal state. There are always many determining factors that influence the direction, extensiveness, and effectiveness of physical therapy, just as there are in all remedial effort.

We refer to such factors as the overall health and vitality of a person, how fully s/he understands exactly what s/he must do and why, how well s/he applies him or herself in the doing, mental attitude and natural intelligence, concentration on the task at hand, how well s/he lives his/her life in accordance with the universal laws of nature, the encouragement and familial support s/he receives, etc. Only in rare instances perhaps will total performance and total benefit be achieved, but even minor positive changes can add up, in the final analysis, to improved appearance and many years of more enjoyable and healthful living.

Because of the nature of this discussion, there seems to be no valid point in quizzing students on the lesson content. This lesson should therefore be used as a point of reference, among others which may be available, in planning corrective exercises for specific individuals having a well-defined structural defect which, in our best judgment, seems to limit their potential wellness.

2. What Is A Corrective Exercise?

Shelton defines corrective exercise as meaning the use of exercise to correct an anatomical defect or deformity, such as the size, shape, position, and so forth of some part or group of parts of the body that do not conform to the norm.

Among the types of defects or deformities which are subject to correction through exercise in varying degrees are the following: club foot, spinal curvature, bow legs, misshapen fingers, poor posture, uneven

shoulders, deformities of the toe, etc.; all, of course, to a greater or lesser degree depending on individual factors.

2.1 How Do Corrective Exercises Differ from Other Kinds of Exercises?

We can divide types of exercises into three main categories:

1. Hygienic exercises which include the more general exercise routines which are designed for Hygienic improvement of the health and vitality of an individual.
2. Remedial exercises are designed to affect certain desirable changes in persons afflicted with adverse physical results from poliomyelitis (less common now with improved sanitation than in former years), paralysis resulting from accidental or other injury, certain spastic conditions, respiratory ailments, and so on. Remedial exercises are usually done under the tutelage of a physical therapist and must be carefully monitored.
3. Corrective exercises are specific in kind, being designed and targeted for a particular area of the body and to accomplish a precise purpose. Corrective exercises can, Obviously be pushed more rapidly and more vigorously than possibly might be done with remedial exercises.

2.2 The Physics of Corrective Exercises

The proper use of exercises to correct a deformity or anatomical defect is based on certain well-known physiological facts and physical laws.

The physiological basis for the use of corrective exercises lies in the fact that while life exists there is change. The body is always in a state of organized flux. Every day cells die and every day new cells are born—all kinds of cells including bone cells but excluding brain and nerve cells.

Brain cells, once dead, do not replace themselves. We lose several millions of brain cells every day, never to be retrieved. Severed nerves cannot be restored but intact nerves, even though damaged, *do* tend to improve, albeit slowly, under careful Hygienic care.

In considering the physical basis for the effectiveness of corrective exercises we observe that the muscles of the human body have two main purposes:

1. To produce a desired movement as and when directed by the central nervous control mechanisms, and
2. To hold the bones in position both in rest and in movement.

Muscles are differentiated from the various and several ligaments which are simply sheets of fibrous tissue which connect two or more bones, cartilages, or other structures; or they serve to support the fasciae or muscles and retain organs in place.

Every muscle and each ligament has received a specific name and is registered in the complex volumes of medical nomenclature, but such precise terminology is not a necessary part of a Hygienist's training unless s/he so desires. There are many medical reference books to supply such information.

It should be remembered that it is the stronger muscles and their accompanying and therefore stronger tendons that become shortened, while the weaker muscles and their tendons become lengthened and weaker over the years.

Such changes are accompanied, in general, by a corresponding change in the length and strength of the ligaments and often, too, in the shape of the bone, and especially so in the ends of the bones where articulation occurs. Dr. Herbert M. Shelton provides an example of what may occur as when there exists a concave curvature of the spine, there simultaneously develops a shortening of the side muscles, tendons and ligaments of the individual thus impaired.

In working with clients, it must be remembered that forcing is always contraindicated. Bones cannot be carried beyond their prescribed normal range of movement without causing injury to the ligaments

attached to or near the joint being moved. It is these ligaments that bind the bones and permit their articulatory movement. Damaged and injured ligaments can prove extremely painful and difficult to heal.

It is the counterbalancing effect of muscles together with the constant turnover of cells that gives effectiveness to corrective exercises.

3. Deformity Is Widespread

There is widespread deformity among the populace today, some of it absolutely appalling. Just a few days ago we saw a striking example of inexcusable deformity in a fully-grown adult woman, in her middle years. She was exquisitely dressed, her coiffure had been arranged with great skill, cosmetics had been artistically applied, but the overall impression created by this woman was grotesque to an experienced eye. Her entire torso was out of alignment, a fact made very evident to us as she teetered by on her four-inch heels.

This woman's entire chest cavity represented no more than one fourth of her total body height, so small in size it was. She gave the appearance of two different women trying to exist in a single body! With such impaired respiratory capacity, her days of living will be severely curtailed. We doubt if very much could be done to correct this woman's structural defects at her stage in life. The older a person is, the more difficult it is to make changes and the longer it will take, all other things being precisely equal.

Another example cited by Dr. Shelton and one we can observe all too frequently in both children and adults is the size of the chest at full inspiration; that is, with deep breath. Only then is it extended somewhat close to the size it should be when fully empty! As many as 85 percent of the children sitting in the secondary school classrooms today have severely-limited chest capacity.

3.1 What Causes Deformities?

Deformity has its roots in many errors. Obviously, most of the damage is done by the mating of two physically-deficient parents who either cared not or had little or no knowledge of the possible consequences, long-term and/or short, of their sexual union; by the poor prenatal care and feeding of mothers; by the lack of exercises during pregnancy, during infancy and throughout childhood and by the physical restraints placed on children today who are foolishly kept indoors in classrooms for long hours sitting in unnatural positions at imperfectly-constructed desks and who receive limited and often inappropriate exercise.

Hygienists and physical therapists generally agree that most deformities are caused by one or more of the following:

1. Poor choice of ancestral heritage.
2. Poor health of parents.
3. Faulty nutrition before and after birth.
4. Continuing and long-lasting systemic fatigue due to many possible assaults, mental and physical.
5. General systemic weakness resulting from a plethora of physiological assaults of one kind or another, especially poor food choices.
6. Astigmatism that gives one an incorrect assessment of surroundings, both immediate and distant.
7. Impaired hearing, especially if in only one ear, a condition which may cause a person to turn his head to the source of sound in an effort to add visual response to the auricular.

8. Poor lighting that causes one to pull his torso away from a more normal stance and toward the source of light, often an occupational hazard.
9. Type of occupation as, for example, the hod-carrier whose one shoulder becomes wider and longer than the other and the bones which form it become thicker and more dense; or an interest or hobby as with the violinist who, after years of daily practice often extended for hours at a time, finds his left shoulder lower than the right shoulder and that the general alignment of the head, neck, shoulders and arms is faulty.

Most deformities can and should be prevented through improved lifestyle. Where they exist, many, indeed most, can be corrected, especially when corrective measures are instigated at an early age, the earlier the better.

3.2 The Most Common Deformities

The most common deformities observed are:

1. Rounded shoulders.
2. Various forms of spinal curvatures including:
    A. Wry neck or torticollis in which the head is drawn to one side and usually rotated to some degree so that the chin points to the other side.
    B. Kyphosis, a term used to indicate an accentuation of the backward curve of the thoracic spine. Kyphosis is a condition which imparts a rounded or hunched appearance since the convexity of the curve is outwards. The degree of curvature, of course, will vary from individual to individual, with some being acute, others less so.
    C. Lordosis, or the opposite thrust of the spine with an exaggeration of the forward curve of the spine causing the condition familiarly known as "sway back," or hollow back. Lordosis is usually accompanied by awkward movement of the buttocks in walking since the deformity often extends to the pelvic area.
    D. Scoliosis, a term used to indicate the side-to-side curve of the spinal column with curvature either to the left or right to form either a C curve or to both the left and the right to form an S curve. The affected person tends to "list" to one side.

Any or all of the above deformities can be multiple in kind as, for example, a combination of both kyphosis and lordosis; or one or more can be combined with individual vertebral malformations and/or rotations of one or more of the vertebrae of the spine.

Spinal abnormalities sometimes appear at birth, perhaps during the growing years, but they usually just creep up on a person as he slowly deteriorates biologically over the years. Generally speaking, the above deformities will usually be the kind that will come to the attention of the Hygienists after they have been well developed.

Spinal abnormalities, which are far and away the most common, and regardless of how classified, generally develop silently and stealthily, without pain. It is interesting to note that perhaps as much as 30 percent of the bone structure can deteriorate before such deterioration can be detected by X rays.

According to the Scoliosis Research Society of the American Academy of Orthopaedic Surgeons, about 10 percent of the adolescent population have some degree of scoliosis. Parenthetically, scoliosis should not be confused with poor posture.

The Scoliosis Foundation states that "there are currently no medications to treat scoliosis, nor can its onset be prevented." Hygienists would agree that the condition cannot be "treated" with drugs but do not agree that such a deformity cannot be "prevented." The human body, like all living things, always tends to grow toward perfection when given the proper tools. We agree with the Foundation in saying that the treatment is mechanical, but we go further in that in any program designed to correct any deformity, it is necessary to employ all the known requisites of organic existence as and when required and as present capacity indicates, these used in conjunction with certain exercises specifically designed to correct the

existing defect.

4. The Spine

The bony part of the spine is made up of a series of separate bones called vertebrae. In humans, the vertebrae are stacked "like a column of poker chips." They are held together by the ligaments.

The number of vertebrae vary, among different species of animals but, in man, the spinal column contains 33 vertebrae, as follows:

- 7 cervical vertebrae in the neck.
- 12 thoracic or dorsal vertebrae in the region of the chest or thorax. These provide the attachments for twelve pairs of ribs.
- 5 lumbar vertebrae in the small of the back.
- 5 fused sacral vertebrae forming a solid bone, the sacrum, which fits like a wedge between the hip bones.

Plus a number of vertebrae which are fused together to form the bottom or base of the spine, known as the coccyx at the bottom of the sacrum.

During the fetal period, the spinal column forms a single curve with the convex surface toward the back. However, at birth, two main curvatures are present, both of which are concave forward. The upper curvature is located in the thoracic and the lower one in the sacral region. With normal development, two compensatory forward curvatures develop in the cervical and lumbar regions, just above the primary curvatures. These provide the resiliency which a stacked bone structure could not possibly provide. Unfortunately, as we have noted, a perfectly-formed spine is a rarity, indeed, in today's world.

As can be seen in the diagrams which follow, the vertebrae serve as protective housing for the spinal cord which functions in the transmission of ascending impulses from all parts of the total body up to the brain and of descending impulses and directives from the brain via the cord to all parts of the total body. This housing is known as the spinal canal. Peripheral nerves from many parts of the body enter into this housing and are affiliated with the main nerve cord. These transmit all manner of information from peripheral centers to the cord and thence to the brain and also appropriate responses from the cerebral centers back to the peripheral regions, and finally to individual cells. Every single muscular movement requires this transmission of information, the cerebral interpretation and the psychological and physical result(s) of the interpretation, the response.

4.1 Not Just a Cosmetic Problem

A spinal abnormality is not just a cosmetic problem, although that can be psychologically damaging in itself since it can lead possibly to rejection by one's peers particularly during the teen years and to depression and social isolation.

But, additionally, since all such irregularities tend to cramp all the abdominal and chest organs and can act. as an impediment to breathing, to digestion, and, in fact, to all bodily processes and will continue to do so throughout all of a shortened life, they should be corrected as early as possible and to the extent possible.

Unless mechanical corrective exercises and perhaps even braces are worn, the deformity can provide a seat for continued degenerative processes with later development of arthritis of the spine with

increasingly severe back pain and disability.

The curvature tends to increase, and as it does it pushes down on the ribs attached to the spine. This in turn, narrows the chest cavity and restricts the ability of the lungs to expand. Thus, the lack of sufficient oxygen intake hampers full metabolic efficiency throughout the lifetime, which as we have noted, is usually shortened.

Dr. Hugo Keim of the Columbia University College of Physicians and Surgeons is reported to have said, "Telling a child with a scoliotic back to stand up straight is like telling a man with tuberculosis to stop coughing." Thus, most specialists insist on using the brace.

The most commonly-used brace, the Milwaukee, consists of "a leather or plastic pelvic girdle to which are attached three upright bars, one in front and two in the back. At the upper ends of the bars is a ring that circles the neck. A child wears the brace 23 hours a day, with an hour break for bathing, swimming or relaxing. Exercises are performed daily in and out of the brace. Total time in the brace averages 36 months, during which the child may take part in most of his usual activities." (Quoted from *Parade*, Oct. 28, 1979.)

If braces are used, they should be employed between the ages of 10 and 15, the period when growth tends to spurt and scoliosis most commonly develops. Dr. Keim maintains that exercises are not sufficient to treat scoliosis, that using the brace is a "must."

Surgery is used in about one out of every 1,000 cases and is resorted to when bracing and exercises prove inadequate or when, in the beginning, it is obvious that other measures are required. Following surgery, the patient must wear a cast that may remain in place for as long as from eight to ten or more months.

At the Hospital for Sick Children in Toronto, a Dr. Walter P. Bobechko and his colleagues are said to be experimenting with the implanting of from three to six electrodes which are inserted into muscles of the back. During the night, while the patient sleeps, "mild electrical impulses are sent to the electrodes to activate the muscles so they gradually straighten the curve." It is said that such treatment can only prove useful in young patients with at least two years' growth remaining and a curvature of less than 40 degrees.

4.2 The Missing Ingredients

All methods presently employed by the medical community depend solely on mechanical gadgets of one kind or another with the occasional administration of drugs to palliate symptoms of pain, to alter the mood when the patient becomes depressed, and/or to "biochemically balance" the mineral composition of the system. Little or no attention is given to the total spectrum of organic requisites or to the universality of the laws of life.

Even a beginning Hygienist knows that when any living creature fails to receive the tools of life, he will eventually, sooner or later, find that his health will decline and his lifespan will be shortened in an amount determined by the extent of failure to meet the organic need. There can be no doubt that the body structure will be adversely affected.

Therefore, while the Hygienist would make full application of the laws of physics and his knowledge of the fact that all healing and repair must be self-instigated, self-regulated and self-powered, s/he would also employ all the known biodynamics of life, fresh air, pure water, sunshine and warmth, all the psychological "pluses of life,"—in fact, all the many "tools" the body must have to straighten out and remodel young malformed spines.

Dr. Shelton in his book *Exercise* on page 262 says, "Lordosis is not difficult to correct, but the corrective work must be continued for a prolonged period." He goes on to state that this corrective work consists of training for proper posture, stretching the muscles and ligaments of the lumbar spine and strengthening the abdominal and psoas-iliacus muscles (lower end of spine), all accomplished in due course, through

the patient and persistent application of muscle stretching and working in specified patterns of movement, all of which, of course, must be pursued with full attention also being paid to all other biodynamics including revision of dietary practices when necessary, daily sunbathing in the nude whenever possible, extended periods of rest and sleep, and so on.

Yesterday, while at the printers, we began talking with a woman who had heard about our interests in matters of health. She told us that her fifteen-year old daughter was afflicted with scoliosis but strangely, according to her, "No one seems to know much about it."

Upon inquiry, we learned that her daughter was receiving mineral medication in the form of multi-mineral capsules and a special pill "because she needs calcium." We asked her to what her doctor attributed her daughter's spinal abnormality and received the reply that "he said that no one knew what caused the condition and nobody knew how to treat it. She had come to the conclusion that her child would just have to live with it, meaning the scoliotic spine.

We suggested that possibly a Hygienist would be able to help her daughter and told her we'd be happy to recommend a good one to her and her daughter, one very knowledgeable about spines. We further encouraged her to study something about Natural Hygiene, that perhaps some dietary improvement might be in order. She laughed and said, "You know how these teenagers are today. I'll never get her off her hamburgers and coke!" And off she went, laughing.

Little did she realize that, in all likelihood, by such casual acceptance of the commonly-held belief that "nothing much can be done," she, in all likelihood, was condemning her child to a lifetime of low-back pain plus a multitude of allied disorders stemming from an impinged nervous system and an impaired digestive tract.

4.3 How to Detect Spinal Abnormalities

The following screening test has been devised by the Scoliosis Association.

With the client standing straight, look at the back:

1. Is one shoulder higher than the other?
2. Is one shoulder blade more prominent than the other?
3. When the arms are hanging down loosely at the sides, is the distance between the arm and body on one side greater than on the other?
4. Does one hip seem higher or more prominent than the other?
5. Does the child seem to lean to one side?

Now, with the child bending forward, arms hanging down loosely and palms touching each other at about knee level, look carefully.

1. Do you see a lump in the back in the rib area?
2. Is there a hump near the waist?

If the answer is yes to any of these questions, professional examination and help is probably in order.

Other visual imperfections can also be noticed as, for example:

1. Does the client have a "swayback" (lordosis)?

4.4 Typical Exercises Suitable for Mild Scoliotic Impairments

1. Test your posture by standing with your back against a wall. Learn the mechanics of good posture by trying to straighten your back. Avoid a lazy slouched posture or a too rigid posture, either of which will tend to emphasize existing curves in the back.
2. Straighten the curve in your neck by standing tall with the chin slightly tucked in. Standing tall, consciously, is part of the Alexander Technique. Notice how it seems to re-align every part of the

body, both internally and externally.

3. Tall girls and boys may try to look shorter by slumping. Most short people tend to have good posture with spines well positioned. Teenagers should be encouraged to straighten the curve in the lower back (swayback) by tucking in the stomach and tilting the pelvis forward (known as the pelvic tilt).
4. Tighten muscles in the buttocks, bending the knees slightly.
5. Stand behind a straight chair. Hold on to the back. Now assume a squatting position. Maintain this position as long as possible. Repeat for from two to five or more minutes several times a day.
6. At work or at home, sit on a straight-backed chair. Lean forward in the chair and lower the head to your knees. Maintain this position for at least one minute. Repeat, until you can hold the position for as long as five minutes. Notice how the back muscles are being pulled.
7. Use the slanting board several times a day. If a slanting board is inconvenient to use, as at work, simply lie on the floor and place both legs on a chair. Press shoulders back to floor. Maintain position for from five minutes (at first beginning) to as long as thirty minutes, after practice.

Many people think that just because the muscles on their arms and legs are strong and muscular, that the muscles on the back will be in a like condition. This is not necessarily so.

The muscles of the back should be thought of as being similar to the guide-wires that support a growing tree. If these wires are strong and kept taut, the tree will grow straight and be flexible but if, however, the wires are loose and malpositioned, the tree may not fare at all well, becoming crooked.

It is the same with the spine. If the tools for proper maintenance are lacking, the spine may become crooked with swayback or some other impairment developing. Therefore, it is important for both the back and the abdominal muscles to be strengthened in all persons, but especially when a scoliotic spine is evidenced. These back and abdominal muscles are the "guide-wires" to impart strength and flexibility to the spine.

4.5 Exercises for More Severe Scoliotic Impairments

These exercises may be performed in addition to those already suggested for milder impairments of the spine.

1. Partial bending forward while maintaining a straight back. Client may sit in a chair while performing this exercise. The number of repetitions (reps) will vary with the vigor of each client. Start with five.
2. Sit on the floor with legs extended out in front. Lean forward and touch toes with the fingers.
3. Lying on the back, elevate feet and legs to vertical position pointing the toes and trying to reach the ceiling.
4. Place client on a table with legs extended in front of him, the knees held straight. Stand in front of subject and grasp both wrists. Have client's feet push against your abdomen. Now pull the client forward and downward as far as possible. Repeat several times.
5. Lie on the floor with the hands behind the head, elbows on the floor. Keeping the knees straight, raise the legs and thighs to a 45° angle. Now, extend the legs outward in opposite directions. Bring back to position. Repeat several times. Relax. Elevate again, extend, etc. Repeat several times.
6. Lying on the back bring the knees up on the chest. Spread the legs apart as you straighten the knees, then draw the feet together. Repeat several times without resting the legs on the floor between movements.
7. Assume same posture as in Exercise 6, imagine a balloon tied on a string being suspended from the ceiling. Kick the balloon away from you, using both feet simultaneously.
8. Lie on the back on a table. Draw one knee up on the chest while the Hygienic therapist resists the movement. Repeat using other leg.
9. In same position as in Exercise No. 8, flex both thighs on the chest against the applied resistance

of the Hygienic therapist.

10. Hang on bar. Raise the knees upward until they are at right angles to the abdomen. Hold for several seconds. Relax. Repeat.
11. Hang on bar. Extend legs outward and upward until they are at right angles. Hold for a few seconds. Relax. Repeat.
12. Hanging on a bar, flex knees as in Exercise Number 10 above. Now, straighten legs outwards. Hold. Relax. Repeat.
13. Simply hang from the bar in a relaxed position for a few seconds. Repeat several times.

4.6 Exercises to Strengthen Abdominal Muscles

As previously noted, it is just as important to strengthen the muscles of the abdomen as those 'supporting the spine in the back. However/in this connection, it is important to choose exercises wisely.

Exercise, to be constructive, should not be easy but, on the other side of the coin, neither should they cause pain. If pain results from a particular exercise, that exercise should immediately be stopped. Pain is a body signal that injury has either occurred, or that one may be imminent. A wise precaution for therapists to follow is to do less than you should early on in working with a client. One can always add on, i.e., increase the intensiveness and/or the extensiveness of a particular muscle movement but, once an injury has resulted from the wrong kind of exercise or the manner in which a particular exercise was performed, then it is too late and further activity must be delayed until full healing has taken place, this sometimes requiring a prolonged rest—delaying progress. It is best always to keep in mind our "baby step" approach. Succeed with small successes.

The following exercises are suggested to strengthen abdominal muscles. They can be done in sequence or selections made to suit a special need.

1. *Lying flat, on the back on the floor*, legs outstretched in front of you, point the toes and stretch to the extent possible. Relax. Notice the pull on the abdominal muscles. This exercise strengthens ligaments and muscles that lie vertically.
2. *This next exercise* may be done in three levels of achievement
   Lie flat on your back with both legs and thighs straight. Point the toes of both feet and raise both legs. Lower and repeat

   The three stages of effort exerted in doing this exercise will depend, of course, upon the strength of individual muscles. It is not wise to attempt Stages 2 or 3 before gaining sufficient strength to perform Stage 1 with ease. After Stage 1 is accomplished, then the client may progress to Stage 2, and so on

   Stage 1. Have an assistant hold down the back while another assists the client in performing the upward movement of the legs. As strength increases, less assistance should be given

   Stage 2. The client places hands under the buttocks and lends support himself as legs are raised. An assistant may hold down the back in the early days of progression, but all assistance should eventually be abandoned as strength improves

   Stage 3. The client should perform this exercise unassisted.
3. *Lying on the back*, raise the right leg to a vertical position. Now carry the leg across the left leg as far as you can. The goal is to touch the floor on that side. Now return the leg to its former vertical position. Repeat. Do the same exercise with the opposite leg being raised and carried to the floor on the opposite side.
4. *Lying on the floor* with the feet hooked under the bed frame or with an assistant holding the feet firmly on the floor, with arms folded across the chest, raise body up to a sitting position
   This exercise may also be done in stages according to present capacity to perform, as follows:
   Stage 1. Instead of placing arms in the folded chest position, place hands under the buttocks to

add additional support to weakened abdominal muscles. Hygienic therapist lends assistance to the upward movement by giving back support

Stage 2. Place hands under buttocks, feet firmly held by either an assistant or under bed frame or other restraint, raise body up to sitting position unassisted by therapist

Stage 3. Hands folded across chest, feet firmly planted or held, with therapist assisting upward movement, raise to sitting position

Stage 4. Perform exercise unassisted

Stage 5. Lie flat on floor, arms extended fully behind head and on floor. Throw arms forward and at the same time, sit up. No assistance. In early days, it may be well to keep knees bent or even to elevate the legs vertically and use their pull to assist the body to attain the sitting position

Stage 6. The difficulty of this exercise may be increased by clasping the hands behind the head and, without assistance, raising the body up to the sitting position. In performing this movement, the arms and shoulders should be held firmly back. Otherwise, this exercise has a tendency to encourage a rounding of the shoulders.

5. Twisting of the torso. Stand upright with feet slightly apart. Place hands on hips and focus eyes on a central spot on the floor. While performing this exercise, keep the eyes focused on this spot. Now, twist to the right as far as possible without straining, then to the right. Up to 20 reps. This is Stage 1

   Stage 2. Focus eyes on a spot about half way up the wall directly ahead of you; or, if out of doors, focus on some central object. Repeat physical movement, twisting to right and left, but keep the eyes on the one spot. Up to 20 reps

   Stage 3. Focus eyes on a spot above in front of you on ceiling. Repeat exercise as above

   A dual benefit is received from this twisting exercise: stretching and firming of the horizontal abdominal and back muscles plus accomplishing the same for the eye muscles. Blinking the eyes after this exercise will help to relax the muscles.

4.7 Exercises to Strengthen Side Muscles

In correcting spinal imperfections, it is important to work also specifically on the side muscles. The following exercises are designed to stretch and strengthen these seldom-used muscles.

1. Stand erect, with the feet together and the arms extended over the head. Bend sideways at the waist, carrying the extended arms over slightly in advance of the head. Bend alternately from left to right but hold each bend for from 5 to 30 seconds. Keep the legs straight as you bend.
2. Rest weight of the body on the right bended knee. Extend left leg out to the side. Now bend the body to the right as far as possible without raising the left foot from the floor. Therapist should assist client in maintaining balance.
3. Repeat exercise no. 2 in the reverse position, resting weight on left knee and extending the right leg and bend to the left.
4. Lie on the right side on floor. Balance body with arms. Raise extended left leg until it is perpendicular with the body.
5. Repeat exercise no. 4 while lying on the left side. (Exercises numbers 4 and 5 may be increased in effectiveness by adding weights to ankles. These may be purchased at almost any sports store.)
6. Stand erect with a barbell of convenient weight suspended across shoulders and behind head. Bend alternately from one side to the other.
7. Rest the weight of the body on the extended right arm and on right foot. Place left hand behind head. Now lower the hips until they touch the floor. From this position, bring the body up and raise the hips until the body is arched. Lower and repeat. Therapist should support and assist on

first doing this exercise and it should not be attempted until back, stomach and side muscles have shown progress.

8. Perform exercise no. 7 from the opposite side, resting the body weight on the feet, extending the left arm.

5. Correct Postural Maintenance Vital To Wellness

The posture of the average American and also that of many others we have observed in our travels is in a sad state. Many deviations from the norm can be observed, especially in the natural curves of the spine. Postural defects are less serious than scoliotic ailments which represent degenerative changes brought about by incorrect habits of living. Postural defects can be more easily corrected than scoliotic abnormalities and in a shorter time.

It is important for the individual to maintain good posture for when the body parts are balanced and integrated, arranged naturally in a flexible manner, with energy and movement directed upward, the whole torso following—going with—the head, the entire body, its cells and organs and systems will be enabled to function more efficiently and in a more flexible manner.

When the body is balanced, correct nerve messages are relayed from one part to another, from one system to another system. There is better coordination and synchronization of part to part. When parts are correctly aligned, one to another, only those muscles which are essential to a particular action will be used to perform that action, thus saving precious vital energy. One can accomplish more and perform better and feel less tired than where the parts remain uncoordinated, poorly synchronized due to misalignment through carelessness or habitual slouching. In other words, when the posture is poor, we work against ourselves, we use energy that we need not expend to perform functional duties and movements just because everything in the body is not in its more proper position of balance. The systemic equilibrium is destroyed, tension pervades the body, even though we may not be consciously aware of such tension. This is exactly the same kind of tension (stress) that is radiated outwards in a leaning tower (as, for example, in the famous Leaning Tower of Pisa located in the Piazza del Duomo in the northeast part of the Italian city), or in a pile of bricks which have been incorrectly stacked.

Incorrect posture, in time, will lead to chronic low back pain, a condition which troubles many people today. There are many causes of poor posture: malnutrition, lack of exercise, occupational fatigue; emotional problems concerned with such things as family, financial security, sprains, disc damage, habits of daily living, etc.

When we consider that the average American spends countless hours every day staring at a television tube while sitting slouched down in an overstuffed chair, it is a wonder that we stand as straight and tall as we do and enjoy any degree of health!

5.1 Pain

Postural low back pain can be consistent and chronic and if we ignore the warning sign of early acute pain and do not begin a series of corrective measure, the aches and pains may become chronic, entering the vertical stage, until sooner or later, the back gives way.

Pain in the back develops when specific nerve endings are abnormally irritated and begin to send distress signals up the spinal cord to the brain's control center. Sometimes, the back muscles will receive

instructions to go into spasm in an effort to hold the back immobile and quiet.

All of us are aware of the fact that there are innumerable nerve endings which intertwine and go in and out of the spinal cord. There are various conditions which can give rise to back pain such as were detailed above, these being both physical and/or emotional in kind. The worst enemies of the back are poor posture, a lack of exercise and overnutrition.

An increased lumbar curve as in sway back is indicative of a weak bony structure. Weak and flabby abdominal muscles (the familiar pot belly) deprives the back of its main support. Any overweight can add to back strain.

The average person when he feels pain simply takes a pill to get immediate relief. As Hygienists well know, such a practice is totally anti-health since chemical pain-killers act to narcotize the nerves, to prevent the cerebral recognition of the systemic danger that is presently threatening the life process. The cause or causes of the pain remain undetected and, therefore, still working.

But, there may be another and less apparent hazard in such a practice. Dr. Steven F. Brena, director of the Pain Control Center at Emory University in Atlanta believes that drugs become "associated with the pain itself, so the very act of popping a pill stimulates the feeling of pain."

It seems that, like Pavlov's dogs which salivated at the ringing of the bell, chronic pain sufferers may unwittingly learn to feel pain from the very drugs they take for relief!

In the Medical News Section of *American Health* for June 1984, Brena is reported to have said that "learning is important factor in any chronic illness." He believes that most people abuse pills. We should probably say that almost all people who use drugs, abuse them. Personally, we feel that pain-killers should only be used in extreme cases, as in surgery or in certain advanced degenerative conditions when all other methods have failed.

Brena compares the central nervous system to a computer. *It can be programmed to be pain sensitive, and the pain threshold lowered.* (Emphasis by the authors.) He calls it "learned pain," a condition which creates further dependence oh drugs. He cites the possibility that pain can become a physiological response elicited by the very drug taken to relieve the pain.

The possibility may exist that pain is not only a molecular cellular response, but also a psychological and perhaps even a social response, the "everybody-does-it" syndrome.

At Emory's Pain Control Center, Dr. Brena attempts to retrain the central nervous system to raise the pain threshold, but he says it takes hard work. It also requires much systemic work to relieve pain.

Orthodoxy has not as yet learned the efficacy of fasting to relieve pain. If our students recall the case of Mike, our severely arthritic patient. After over fifteen years of high drug dosing to relieve his excruciating pain, he recently reported that he had just had two whole days during which he was totally without pain! Mike, our students will recall, has had two knee caps removed as well as one elbow joint. Considerable fusing of his skeletal structure has made him almost, completely dependent upon others for his basic needs. What he has accomplished under great odds should inspire the most downhearted among us. A veteran, living alone except for the help of a university student, he has, with great determination over the past year fasted for short intervals and completely changed his dietary, has squeezed his rubber ball, has walked his corridor from bedroom to livingroom, faithfully and consistently, and is now beginning to reap his reward! Mike knows that the future is his to have, an unnarcotized future and one without pain.

Back in about the year 1945, Dr. Elizabeth injured her back badly. A heavy iron spring which helped to raise and lower a garage door gave way throwing her up in the air and then back on the concrete driveway. The pain was intense, but she refused all attempts to hospitalize her. She took as few aspirin as was possible. We were not Hygienists, yet!

Years later, when locking of muscles and the intense pain of arthritis descended upon her, the worst pain

was felt at the site of this old injury. Of course, over the years, she had "favored" her back but in the late fifties, she began to notice that she couldn't walk either as long or as easily as she once had been able to do. Dr. Elizabeth, early in her career, had taught physical education as well as Swedish gymnastics. She had been a track star while in high school, took interpretive dancing while in college. The psychological effect of her disability obviously was intensely negative.

In the early sixties came the final episode which was to start us on our search for a "cure." By this time, Dr. Elizabeth had to hang on to another person to walk. If she got down on the floor, she had to have assistance to get up. She walked the floor night after night because of the pain.

It was then that we began a program of therapeutic exercise, learning about it and putting what we had learned into practice. Every night, Dr. Robert massaged her back, using open fingers along the spinal column, gently pressing along the lateral muscles outwardly.

As she lay on the floor, her legs were, at the beginning, lifted for her to a vertical position, and then lowered. Gradually she progressed through the exercises which are detailed in this lesson. She set herself goals to achieve and as she achieved one goal, she would move on to the next.

Let us see the sequence that took place with the bent-knee sit-ups. Her first goal was to perform a single sit-up without assistance. At first, her back had to be helped in raising to the sitting position. But, the time came when she made it alone!

The next goal was to do 10 unassisted sit-ups with hands held under the thighs. When this was achieved, she placed her hands at her sides. The new goal was to do 10 situps again. Then, to do 30! About two years ago, Dr. Elizabeth did 30 unassisted sit-ups holding her hands at her sides.

But, she wasn't finished, yet! Her next goal was to accomplish 10 straight-leg sit-ups starting from a position where her arms were extended behind her on the floor. These were to be used as a leverage in achieving the sitting position. After about six months she was able to do 20 of these. She hadn't, as yet, reached her final goal: to do 30 situps with hands clasped behind her head, but she knew she'd get there one of these days.

Then, it happened! Another accident. Several months ago, she was out feeding her beloved birds. It was an unusually cold morning for Tucson. Having several appointments scheduled for that morning, she was in a hurry and caught her open-toed slipper in the curled hose which was rigid due to the overnight freeze. She went sailing through the air, landing on her right side and skating along the gravel which tore at her muscles and ligaments.

For weeks, Dr. Elizabeth could hardly move. She took no pain killers in spite of the severe pain. Hot baths and occasional short fasts took away all the discomfort but she was unable to do a single sit-up, to say nothing of most other exercises. But was she defeated? Not Dr. Elizabeth! Just the other day she did 26 bend-knee sit-ups, her toes tucked under the bed frame. She's off again with new goals beckoning down the road.

Incidentally, for females over the age of 60, those achieving bent-knee sit-ups in 90 seconds are awarded the Platinum Accolade. Dr. Elizabeth did hers in 60 seconds and she confesses to being over 70!

We have included this story in this lesson, not to brag, but to make a point. In working in the field of corrective exercises, patience and persistence will be rewarded.

In the legal world, there is an old saying, "Time is of the essence." This phrase is found in many contracts, especially those having to do with the sale or purchase of real estate. It means that within a certain time frame, the contract must be fulfilled and all legal obligations with respect to that particular contract must be fulfilled.

In correcting spinal or other physical imperfections, time is also of the essence but here the phrase must be interpreted differently. Corrective work cannot be hurried. The body will establish its own schedule and cells will be repaired according to a cerebrally-devised master plan. The repairing and healing will

take place methodically, generation by generation of cellular replication, as the body receives the proper tools—all of them. We refer, of course, to the biodynamics of organic existence.

It would be the height of folly, for example, to. expect recovery to occur with speed if proper-food be not eaten, or should the impaired individual fail to obtain maximum rest, both physiological, mental, sensorial, and physical; or any other of life's basic needs.

It is this one element of time that is perhaps the most difficult of all principles for the novice Hygienist to grasp. Correcting defects in the physical structure requires the most time of all. It is slow work.

Generally, immediate results cannot be seen. They are not visible, they are often not even felt, but they are there! They take place internally, within and about the cell communities of muscles, ligaments and bones. One generation of damaged cells is discarded, recycled, replaced by healthier cells, more efficient cells, cells that are less stressed. Time is of the essence! Patience and persistence in answering the body's basic needs will eventually occasion only salubrious results.

5.2 Sports Injuries

Failure to warm-up before exercising vigorously, failure to cool down following exercise, and not knowing how to perform correctly various stretching exercises are generally considered the most common causes of sports injury.

The most common sports injuries are: soreness, side stitches, cramps, low-back pain, knee injuries, shin splints, tendinitis, bursitis, stress fractures, heel spurs, plantar fascitis, and common sprains.

Generally, incorrect stretching of muscles and failure to obtain sufficient flexibility and suppleness of muscles through sustained continuous and graduated exercise prove to be major factors in sports injuries; again, the failure to recognize that it takes time to develop physical wellness, including muscular wellness.

When muscles are stretched too fast, or in bouncy jerking motions, the body responds with the "stretch reflex," or the tendency of a muscle to contract instead of relaxing when stretched too quickly or forcibly. Therapists and sports experts suggest that all stretching, to be beneficial, should be done in slow, gentle movements not to the point where pain is felt. Stretches should be held at least fifteen seconds. Some recommend increasing the stretch time to as long as 30 seconds for maximum benefit.

Simple sprains are the most common back injury and often occur when muscles of the back or the ligaments are stretched or torn. Common activities that people generally don't even think about, when done improperly, can result in back sprains; simple everyday activities as bending, lifting, standing or sitting. This is why we emphasize in this lesson the need to proceed slowly when corrective exercises are introduced for any purpose.

Back sprains can also result from accidents as, for example, being wrenched when cars collide. Dr. Robert years ago suffered a severe back trauma when he swerved to avoid hitting a pick-up truck which carried two young children in its open back. He was grabbed by the passenger in his car at the same time. He suffered for several years before he eventually recovered.

Slipped or ruptured discs are uncommon, but can cause severe pain and even complete disability.

Sometimes such slipped or injured discs can pinch the spinal nerves causing pain to radiate down the back of the thigh and leg—the "sciatica" pain. If the pinching continues, actual irremedial nerve damage can result. Osteoarthritis can be a major factor in back pain, specially in the late middle years. Spurs and sponging causes narrowing of discs with nerve impingements which cause the pain.

Male prostate problems and uterine problems in females, constipation, etc., are all probable factors which will influence the amount of pain felt.

Routine X rays of the back can only reveal bone changes and this only after there has been as much as 30% deterioration. They do not reveal sprains, slipped discs, etc. Other measures and tests may be

required to identify a slipped disc.

5.3 How to Keep a Straight Back and Improve Posture

There are certain "Dos" and certain "Don'ts" that are applicable to sound body back mechanics. They apply when sleeping, sitting, driving, standing, walking and in lifting.

Sleeping - Sleep on a mattress that you find comfortable. In general, most specialists in back problems agree that a firm mattress will supply the best support. Sleep on your side, in the fetal position, with the knees bent. Some persons find that sleeping on the back with a pillow placed under the knees provides the most comfort. Sleeping positions can often prove a moot issue since the average person changes his position many times during the hours of sleeping and does so without his conscious awareness of he fact. A good general rule of thumb, therefore, is to assume a comfortable position and just relax.

Sitting - Most chairs are an abomination. They are made to fit average people and actually there are few individuals who are "average." Therefore, most chairs are uncomfortable and stress the back.

Chairs should be low enough so that the sitting individual can place both feet on the floor with his knees somewhat higher than his hips. It is not wise to cross the legs at any time. If your sitting chair has legs that are slightly too long for you, you can elevate the legs by using a stool or have a carpenter or handyman make a correction in the height. Always sit firmly against the back of the chair. This will assist the spine to maintain a straight alignment.

Driving - The car seat should be adjusted forward so that the knees remain bent. They should be maintained higher than the hips. The driver should sit straight and should drive well balanced keeping both hands on the steering-wheel. An elongated cushion placed against the back of the seat may assist posture since few car seat cushions are designed with correct posture maintenance in mind.

Standing - If a person with back pain must stand at his work, he should stand with one foot up, changing positions often. If he is required to bend over, he should do so by bending with the knees while keeping the back as straight as possible.

We recall one housewife a number of years ago who had suffered much pain following a back injury.

While working in her kitchen and around the house, she made it a strict policy never to bend down to pick up an object or to obtain something kept in a lower cupboard.' Instead, she would always do a deep knee bend while holding on to the sink or some other fixed object.

She told us that she had been amazed at first to find out just how many times she was required to do her "deep-knee act," as she called it, during the course of a single day. However, she was well rewarded for this one simple discipline which she imposed upon' herself. Her back gradually improved and she found that the exercise helped her in other ways, too, since she began to enjoy greater vitality than she had known prior to the injury.

Walking - When walking, one should maintain the "Tall, I AM Somebody Look." Let the head touch the sky and the entire body will have to follow. Tuck the chin in, but keep the head slightly forward in an unstressed position. The pelvis should be slightly forward and the toes should point the way—straight ahead!

Always wear comfortable walking shoes, preferably constructed of some sturdy, but porous material which will lend support but also permit gaseous toxins to escape. Walk at a fast pace, swinging the arms vigorously. This kind of walking, as opposed to leisurely strolling, will serve to strengthen back, side and abdominal muscles as well as those of the extremities.

Lifting - We have all heard the rules. I'm sure, about how to lift heavy objects, but how often we fail to abide by them. Therefore, perhaps it is in order for us to repeat them for the benefit of our students as they work to correct other people's errors. Perhaps the advice of our housewife will help us to remember them. Always bend with the knees, not with the back. Keep the back straight. Lift with your legs and

hold the object close to the body. Lift only to the height of the chest. And always see to it that your feet are firmly planted on an even, non-skid surface.

If an object is heavy, get help. Don't try to prove anything by trying to lift or shove heavy loads and avoid shifting that can throw a person off balance and cause a sudden twisting of the body which can sprain or tear a ligament.

5.4 If There Is a Back Injury, Certain Common Habits Should Be Overcome

1. If you must lift a rather heavy object, make certain that the destination of the object, i.e., where you will place that object, is directly ahead of you. This will help you avoid twisting the body.
2. Don't try to lift anything above shoulder level.
3. Don't wear high-heeled or platform shoes. Any sudden throwing off balance might cause further injury. Additionally, when such shoes are worn, the center of gravity is thrown off the norm, thus rendering an individual more likely to lose balance. High heels also tend to cause organs to shift from their normal alignment, a state of affairs that sends silent stress signals tearing through the nerve pathways.
4. Don't forget to have the car seat adjust to YOU. Stretching for the pedals or for the steering wheel increases the curve of the lower back to cause strain.
5. When sitting in a chair, don't slump. Avoid leaning forward for any prolonged length of time. Arching the back in this manner is conducive to more pain.
6. If your mattress is uncomfortably soft, or it sags, or if the cushions in a favorite chair do not give full support to your injured back, make some changes. Without full support, an aching back will continue to trouble.

6. Exercise—General

6.1 Exercises Designed to Stimulate Circulation and to Stretch Tight Muscles

Performed While Sitting—

1. Sit well balanced on the floor with both legs stretched out in front of you. Pull knees up to chest. Relax. Touch head to the knees. Relax. Repeat. At first, you may not be able to bring knees all the way up or to touch them with the head. Persistence will soon pay off.
2. In same position, place the arms under bent knees. Now, straighten out right leg. Return to original position. Straighten out left leg. Return. Repeat, alternating legs.
3. In sitting position with legs stretched out on floor in front, bend forward from hips keeping the back straight with arms bent at elbows and held in to side. Hold bent position, but do not bounce.
4. In same position as in no. 3 immediately above, spread legs apart and stretch down first to the right leg and then to the left, maintaining the straight back at all times. Hold the stretch position for the count of 5 each time before relaxing.
5. In the sitting position, place pillow under calf and rotate ankles of left leg, then the right leg.

Performed While Standing—

1. Clasp hands behind the back. Now straighten the arms, shoulders, and back. Breathe in quickly to the count of 4. Relax and breathe out to the count of 7. Repeat.
2. Raise arms to the front, breathing in as you raise the arms and exhaling as you lower them—as

follows:

a. Raise to shoulder height. Then lower to side.
b. Raise above head, stretch to the ceiling. Let the eyes look at the ceiling. Lower to side.
c. Raise above the head, turn the palms out. Lower to side.

Start this exercise with 3 repeats and gradually add more as you feel comfortable.

3. Place hands on sides directly in front of hip bones. Now bend forward to a horizontal position. Keep back straight. Feel the stretch in the back and legs. Bend knees slightly and then come up to straight position.
4. With the feet slightly apart, elbows bent, rotate shoulders front to back several times. Reverse and rotate back to front.
5. Deep knee bend. Just bend knees slightly. This will be sufficient to exercise many muscles without attempting the deep knee bend which may traumatize injured parts.

Performed While Lying on the Floor—

1. Lie on the back with legs straight on floor. Pull right knee up toward the chest. Hold in this position to count of 10. Be sure to tuck the chin in, do not let head fall backwards. Repeat with left knee.
2. Pull both legs up to chest and hold in this position with arms clasped around knees for a count of 10. Don't forget to breathe as you count.
3. In same position as in exercise two. 2, extend right leg up and forward into the air. Lower slowly. Repeat with right leg several times and then perform the same movement with the left leg.
4. Turn and lie on one side. Place hand under the head. Bend the bottom leg slightly. Now raise the top leg up and down, pointing the toes. Repeat several times.
5. Turn and lie on the other side and repeat the same exercise.

Performed on the Hands and Knees—

1. Get in position on hands and knees and relax. Now hump the back. Push it up as far as is comfortable. Relax. Repeat.
2. Same exercise as above, except as you arch the back, bring the head down. Now bring right knee in towards the head, then straighten leg out again behind you as you raise the head and straighten the back. Repeat several times with right leg, then repeat exercise using left leg.
3. Sit back on the heels. Now stretch out your arms and head on the floor in front. Hold for a few seconds, then return to original position. Repeat several times.
4. Lie on the stomach. Then place the elbows on the floor and clasp hands together in a fist. Place forehead on the clasped hands. Now straighten the right leg out behind and raise it upwards as high as you can. Lower. Repeat several times. Repeat with left leg.

6.2 Exercises for Balance, Posture, Circulation and Increasing Coordination

1. Place feet together, arms hanging at the sides. Now, lift both arms over the head and, at the same time, bend the left knee up to the chest as high as possible. Hold a few seconds. Return to position. Repeat with right knee in the same manner. When comfortable doing this exercise, client should try to alternate, using first one leg and then the other while maintaining balance.
2. Stand with the feet together, one hand on the wall or a piece of furniture to lend support. In two even counts, swing the left leg forward and back. Keep the back straight, pull the abdomen up, and elevate the chest as the leg swings back. All the movement should be in the hip. Keep knee straight and the leg swinging like the pendulum in a clock. Repeat with other leg. Assistance in maintaining balance may be required by persons with severely-weakened muscles.

6.3 Exercise Planning

In working with clients, it is always advisable to present the exercises in series; that is, this week do

these, next week, another set, and so on. This will sustain interest by giving variety to the program. Clients should be advised to perform exercises, when possible to music. The tempo of the music should be varied according to the age and condition of the participant(s). For example, for a class of older persons or when working with an older client who may not have exercised for many years, one might choose a melody like "Somewhere My Love" (Lara's Theme from "Doctor Zhivago"). As participants become more skilled, the tempo can be increased causing the exercises to be performed more quickly. However, remember that with corrective exercising, persistence is more important than the tempo. That is why we also recommend that the practicing Hygienist set up a schedule for his clients to follow. A sample suggested schedule follows:

	Monday	Wednesday	Friday
First Week	Ex. A	Ex. B	Ex. C
Second Week	Ex. D	Ex. E	Ex. F
Third Week	Ex. A	Ex. E	Ex. C
fourth Week	Ex. B	Ex. D	Ex. F

The selected exercises should be typed out, xeroxed and Numbered A, B, C, etc.

On the fifth week, a new series may be given the client. Exercises should be selected keeping in mind the reason for a particular exercise. The exercises given in this lesson have been selected with certain definite problems in mind, such as posture, bent spine, weak back muscles, weak abdominal muscles, etc. There are many other possible defects that may present themselves to the Hygienic practitioner from time to time, and we have presented only the most common. The practitioner in working either with a group or with an individual must choose the particular exercises which, in his best judgment, will prove most conducive to good results.

6.4 Teaching the Client How to Get the Most Out of Exercise

There are several important rules to follow. When a precise schedule is formulated and presented to the client, s/he will be much more likely to do the exercises. S/he should be told to study your suggestions carefully and to follow them, if s/he wishes to secure the most good from the exercises. The following list contains suggestions only.

1. Make up an exercise chart and mark down the time spent doing the exercises and the precise number of repeats achieved.
2. Study the exercise routines, consult the recommended list given to the client by the practitioner. The practitioner should always demonstrate each exercise to the client and have the client do the exercise in his/her presence to be sure that full understanding of exactly what is involved in each exercise is achieved. If the client is unable at this time to do the selected exercisers) on his/her own, some other person who may be called upon for assistance should also be present so that s/he may become familiar with each of the movements.
3. Set a regular time to exercise and follow a regular program each day.
4. Make, frequent check-ups on weight and improvements in sleeping, in eating, in ease of motion, etc. These may be recorded on the client's chart. All improvements should be brought to the attention of the client. These are the "successes" we have previously mentioned. They serve to encourage clients in their corrective work.
5. Exercise before meals, or wait at least one hour after eating, preferably two hours. Exercising

before breakfast is a good practice.

6. Provide a suitable rug, floor mat or beach towel for the exercises performed while lying down on the floor.
7. Begin with a 5-minute exercise program and extend as endurance, vitality, etc., increases. Thirty minutes a day will prove sufficient for the average person. Even spending fifteen minutes every day with a half hour several times a week will be highly beneficial.
8. See that the ventilation is good. Keep the windows open while exercising or, better yet, exercise out of doors, except in very cold weather.
9. Wear loose garments made of open weave.
10. Exercise to music. Waltzes are excellent to start with, increase beat as strength and skill increase.
11. And, finally, exercise faithfully and follow instructions. Remember, that when a client first starts an exercise program, his/her muscles are usually weak and flabby. We recommend that everyone start out by exercising one day and then resting the next.

7. Questions & Answers

My daughter has been told that she has Scoliosis. Our doctor says that not much is known about this condition and that diet won't help, that the condition is inherited. The only thing he can do, he says, is to refer her to a bone specialist who will probably put her into a brace and she may have to wear this brace for a year or two. What do you think about all this?

How old is your daughter?

Fifteen on her next birthday, which will be in two more months.

Not having seen your daughter's condition, of course, I can make no specific recommendations nor offer any valid opinion as to what the full application of Natural Hygiene principles and practices might permit her body to accomplish, but I can say this: under full Hygienic care, her general condition would improve. It might well be that he would have to wear a brace for a time, but, with proper food, a lot of rest, and getting out in the sunshine and performing suitable exercises, her improvement would be much more rapid and, in all likelihood, she would not have to wear that brace for nearly as long a time as if she did not meet her systemic needs adequately as would be the case, no doubt, if she were placed under allopathic care, especially when the physician in charge fails to recognize the importance of a physiologically- and biologically-correct diet. At age fifteen, she should not delay another moment to get started. Having a good posture at this important time of her life, may well determine the quality of the rest of her life.

My daughter has the same condition. Her spine is crooked—forming an S curve. My husband and I are both Hygienists, but our daughter thinks we are way off the path. She won't eat anything but what the "crowd" eats and that's hamburgers, french fries, cokes and even beer when they party. What can we do?

There is little that you do except perhaps to lay it all out for your daughter. In this lesson, you have learned the importance of posture, how this crooked spine can influence adversely every single function within the body. Try to get your daughter to read this section and perhaps her future may become more real to her. In your own home, you can see to it that only good food is in the refrigerator. Learn how to prepare natural "delights" such as banana

ice cream and you might hold a fruit party for your daughter's friends. Also, promise her a reward for good behavior after a certain short period as, for example, a theater party or a camping trip; whatever she would like to have or do most. Use this as an incentive. When you have done all this, you have done your best.

It seems to me that everybody has different ideas about how to tackle body defects; at least, physical and structural imperfections. One chiropractor I know puts bottles of pills on the chest of his patients and then recommends zinc or calcium or whatever to the client if there is some spinal malposition. Why are your methods any better than his?

I never knew health to jump out of a bottle of pills and magically into the body. Taking hundreds and thousands of pills can never straighten a crooked spine. The only possible means to correct a body defect which has been caused by a failure to meet systemic needs is to begin, and at once, to meet those needs and to move bones and muscles so as to balance the incorrect action of other bones and muscles. The correct diet and lifestyle will take care of the inside, the internal needs of the body, while the exercise and other Hygienic biodynamics will help the body to repair the defect to the extent possible, as determined by the age, present condition of the individual person and by how well he applies himself to his program.

Not everyone would be able to have the patience to correct structural defects since it seems to take so long.

We have a simple answer for this question. Without patience, knowledge, determination and willpower, the unfortunate one must just learn to live with his defect! Furthermore, his/her life by the very nature of the life process, will be less enjoyable, less productive and curtailed in many ways—not a very enticing exchange!

Article #1: Excerpt from Funk and Wagnalls New Encyclopedia

The following excerpt from *Funk and Wagnalls New Encyclopedia*, Copyright 1979 is used to illustrate the complexity of structural movement so as to give us perhaps a better appreciation of the synergism that is involved even in simple structural manipulation. Excerpted from Volume 19, pages 118-119.

The human skeleton consists of more than 200 bones bound together by tough and relatively-inelastic connective tissues called ligaments. The different parts of the body vary greatly in their degree of movement. Thus, the arm at the shoulder is freely movable, whereas the knee joint is definitely limited to a hingelike action. The movements of individual vertebrae are extremely limited, the bones composing the skull are immovable. Movements of the bones of the skeleton are affected by contractions of the skeletal muscles to which the bones are attached by tendons. These muscular contractions are controlled by the nervous system.

The nervous system has two divisions, the somatic, which allows voluntary control over skeletal muscles, and the autonomic, which is involuntary and controls cardiac and smooth muscle and glands. The autonomic nervous system has two divisions, the sympathetic and the para-sympathetic. Many, but not all, of the muscles and glands that distribute impulses to the larger interior organs possess a double nerve supply, in such cases the two divisions may exert opposing effects. Thus, the sympathetic and

parasympathetic systems respectively increase and decrease heartbeat. The two nerve systems are not always antagonistic, however, for example, both nerve supplies to the salivary glands excite the cells of secretion. Furthermore, a single division of the autonomic nervous system may both excite and inhibit a single effector, as in the sympathetic supply to the blood vessels of skeletal muscle. Finally, the sweat glands, the muscles that cause involuntary erection or bristling of the hair, the smooth muscles of the spleen, and the blood vessels of the skin and skeletal muscles are actuated only by the sympathetic division.

Voluntary movement of head, limbs, and body is caused by nerve impulses arising in the motor area of the cortex of the brain and carried by cranial nerves or by those that emerge from the spinal cord to reach skeletal muscles. The reaction involves both excitation of nerve cells energizing the muscles involved and inhibition of the cells that excite opposing muscles. A nerve impulse is an electrical change within a nerve cell or fiber; it is measured in millivolts, lasts only a few milliseconds, and can be recorded.

Movement may occur also in response to an outside stimulus; thus, a tap on the knee causes a jerk, and shining a light into the eye makes the pupil contract. These involuntary responses are called reflexes. Various nerve terminals called receptors constantly send impulses into the central nervous system. These are of three classes: exteroceptors, those sensitive to pain, temperature, touch, and pressure; interoceptors, which react to changes in the internal environment; and proprioceptors, which respond to variations in movement, position and tension (especially important in doing corrective exercises. -The Authors).

These impulses terminate in special areas of the brain, as do those of special receptors concerned with sight, hearing, smell, and taste.

Muscular contractions do not always cause actual movement. Ordinarily, a small "fraction of the total number of fibers in a muscle may be contracting. (One reason why it takes prolonged periods of time to accomplish desired results—The Authors.) This serves both to maintain the posture of a limb and cause the limb to resist passive elongation or stretch. This slight continuous contraction is called muscle tone.

Article #2: Exercise

An excerpt from *The Genesis and Control of Disease* by George E. Weger, M.D.

Those who exercise during the period of elimination (this refers to the Circadian Rhythm Cycles. The elimination cycle normally begins at about 4 a.m. and continues to, approximately, the noon hour—The Authors.) help to maintain muscular vigor, which appreciably curtails the period of recuperation. Exercises also stimulate the circulation and arouse lethargic cells so that these may more readily give up unusable waste.

An active, supple body can withstand shock, strain, and disease-building abuse to a degree that would wreck or kill the lazy, slow-moving individual. Exercise is just as essential as a rational diet. Dependable resistance cannot be attained without it. All people should exercise daily. The best way to cultivate the habit is to follow faithfully and methodically a regular, fixed program. This assists in the development of self-control and self-discipline, which are so necessary to those who wish to acquire poise and to become masters of self.

Only in the most profound states of enervation or in cases of inflammatory fever, or cardiac depression is positive exercise contraindicated. Moderate tensing of the arms, legs, abdomen and neck, can be done

in bed in the prone position even during the fast. Patients are asked to do these tensing movements for periods of ten to thirty minutes depending upon the vitality and muscular vigor of the person. (See lesson on "Exercise in Sickness and Recuperation" for list of tensing exercises which can be used for corrective purposes while confined to the bed.) ... Willpower is necessary in order to make the start and go through with it.

... To obtain the maximum good, the muscular contraction should be positive and the mind should be concentrated on every movement. Exercise done grudgingly is of little value. The benefit derived depends on the manner in which the movements are done rather than the time involved. Each movement should be emphasized and done with deliberation. To avoid holding the breath, patients are asked to count aloud, as follows: one, and two, and three, and four—and so on. All movements should be repeated to the point of reasonable fatigue as distinguished from overexertion.

It is suggested that patients try to awaken early enough in the morning to do this most necessary work before breakfast. If they do not, ready excuses are likely to come up that will cause it to be entirely neglected. The exercises should be repeated before retiring for the night. Some are advised also to do them in the middle of the afternoon.

... To each patient is given a chart explaining the movements that may be done in bed. These are very simple muscle-tensing and joint movements starting with the fingers and taking in the different joints of the upper extremities to the limit of their range of normal motion in flexion and extension in the following order: the fingers, hands, and wrists in flexion, extension, and rotation; elbows the same; shoulders, a sweeping motion in all directions with the arms fully extended throwing them outward from the body and then bringing the hands together on the return movement. Then the toes should be bent down and up, next the feet and ankles. A folded blanket should then be placed under the hips.

Knee and hip exercises are best obtained by the bicycle movement and also by crossing the extended legs past each other to and fro. Next the blanket or pillow should be placed under the shoulders to allow the head to drop back: the head should be raised and lowered and swung and rotated in all directions. Next the muscles of the abdomen should be alternately tensed and relaxed and also kneaded with the fingers or knuckles. The position of the body should then be reversed with patient on hands or elbows and knees. The back should be alternately humped and swayed and the entire body moved as far as possible forward and back. Swaying and twisting of the spine and torso may be done while sitting on the edge of the bed or on a chair or while standing. Many other movements may be suggested in cases where special advice is needed.

Article #3: Good Posture by Dr. Herbert M. Shelton

The upright position is man's natural one, but, due to many causes, the great majority of civilized men and women are stooped and round shouldered. "Old man's stoop" is the posture into which everyone is drifting unless his or her occupation or gymnastic activity is such as to counteract the tendency in this direction.

... Notice people as they walk, you will see that few walk well. Bad positions in sitting are so common we hardly notice them. Go into any school room and you will see boys and girls, go into any audience and you will see men and women, the majority of them, sitting in the most uncouth and unhealthy attitude. This is an indication of physical weakness, want of physical culture, and inharmonious development. The lungs are cramped and the stomach, liver and all of the abdominal organs crowded out

of their positions.

Good posture is good form. Certainly good posture is of as much importance as the correct pronunciation of words over which the schools spend so much time, while neglecting posture. Upon the upright attitude depends the usefulness of the senses, complete respiration, the ability to talk, speak or read with correct tone of voice, and the most efficient use of the body. Erect carriage is exceedingly important to health and vigor, as well as to best appearance:

Why are we so particular about the forms of our horses or dogs; why do we refuse to buy one with low head, limping gait, or halfhipped appearance, with weak lungs and scraggy body, while we are willing to be and become all of these ourselves.

What is designated body mechanics has reference to the mechanical correlation of the various systems of the body, especially in reference to the skeletal, muscular and visceral systems and their nerve supply. When the mechanical correlations of the body are most favorable to the function of its various parts, this is designated normal body mechanics. Any lack of correlation in any of its parts that hampers, or impedes any of its functions represents a deviation from the norm or ideal.

Many deviations from normal mechanical correlation in the body result in visceral malpositions and in strain, thus resulting, not in disease, but in general impairment and enervation. To secure the best results in function in the body, all of its structures must be properly aligned and correlated. Those parts that are malaligned are under stress and strain at all times, hence wear down more rapidly than do properly aligned parts.

Dr. Skarstrom says, "Erect carriage, easy poise and fine bearing, when habitual, signify perfect adjustment, weight distribution and balance of the different parts of the body. They represent economical distribution of muscular tension, a high degree and even balance of muscular tone, equalized pressure on the surfaces of joints and minimum tension on their fibrous structures. All this implies readiness for all kinds of action, elimination of unnecessary strain, conservation of energy.

Good posture also means the most favorable conditions for the internal organs as regards room, free circulation, relative position and natural support. Thus it makes for health and efficiency, as well as beauty and harmony.

... The precise degree to which faulty posture interferes with normal body function is not easily measured. There is, however, considerable evidence which shows that the stresses and strains produced by faulty posture, especially those assumed and sustained in work, are responsible for much pain, including "referred pains" and even functional visceral impairments. Ours is a day of stooped shoulders, relaxed abdominal walls and sagging viscera.

Lordosis of the lower spinal column is accompanied by kyphosis in the upper back and lordosis of the neck, the upper curves being compensatory. Changes in the curves of the spinal column result in changes in the attached structures thus throwing strain upon the supporting ligaments malpositions and sometimes crowding of the viscera, circulatory impediments, perhaps even nerve irritation from pressure.

Lordosis causes a forward tilting of the pelvis thus forcing the abdominal viscera against the front wall of the abdomen, the muscles of which become stretched and this under constant pressure. The attachments of the mesentery to the lumbar spine are also lowered by lordosis so that the intestines and other supported structures are permitted to sag and assume lower positions in the abdominal cavity. There is evidence that the liver may rotate forward and to the right thus stretching the common bile duct and perhaps, in some cases seriously interfering with bile flow. Ptosis of the kidneys, especially of the left kidney results in traction on the renal veins. The pelvic organs are also involved in the general visceroptosis that results from faulty posture. The ovaries are ptosed, the uterus becomes malposed due to the weight of the sagging abdominal viscera resting upon it, varicose veins of the lower bowel and various impairments of the reproductive system are possible results of the impeded venous flow. The relaxation of the abdominal wall and the crowding of the abdominal organs in the lower abdomen and

pelvis permits an increase of blood in the venous reservoirs of the abdomen, thus diminishing the blood volume. This pelvic and abdominal engorgement may also contribute to tumor formation.

Disturbed lateral (side) balance of the spinal column gives us unequal shoulders (one shouder is lower than the other), a neck that angles in one direction or another above the shoulders or a head which is set crooked on the neck. Such defects of posture and evidences of poor body contour may result from a tilted pelvis, one leg being shorter than the other, or from habit.

... Proper posture is a normal by-product of healthful living and proper body activity. Nearly all of the activities of civilized life encourage the forward position of the head, arms and shoulders. There is a drooping or forward position of the head, a forward displacement of the shoulder girdle and more or less depression of the chest. This is not due to any inherent inability of the spine and associated structures to maintain the upright position. One writer says, "It is not correct to say that spines are not perfectly adapted to the upright posture; it would be more accurate to say that human spines were not evolved to withstand the monotonous and trying posture entailed by modern education and by many modern industries."

... The physical factors which determine posture are (1) the size and shape of the bones and their articular surfaces; (2) the relative length and tension of opposing muscles and fibrous structures; (3) the degree of localized muscular control.

The relative size or shape of ribs, clavicles, scapulae, and vertebrae, as indicated by the general configuration of the chest, shoulder and back, is largely a matter of nutrition and "heredity." However, their sizes are influenced to some degree by the use of these parts, especially during the growing period; for, use or exercise not only influences the size and form of the bones directly, through the demand made upon these by stress and pressure, but also, indirectly, through the constant tension on the bony segments from the resulting muscular tone. I have observed that well-nourished children are straight postured while malnourished children tend to let their shoulders and head droop and sag. I do not doubt that malnutrition is one of the chief causes of early faulty posture.

From Exercise! by Dr. Herbert M. Shelton

Article #4: Correcting Sensitivity to Light by Edwin Flatto, N.D., D.O.

Nature has designed our bodies so that muscles not in use will atrophy. Muscles that are constantly used will become stronger.

The mechanism of the eye which controls dilatation and contraction of the pupils is an automatic one. Those individuals who have developed a sensitivity to light should practice the following:

1. Forget to wear your sunglasses more often until you have found you don't need them.
2. Throw away the Venetian blinds, make dresses and tablecloths from your drapes, and take advantage of the natural sunlight in your home.
3. Try to do as much reading in natural light as possible. If the sun is too strong, cover the bottom half of the book with a black paper or cloth to avoid reflected glare from the printed page.
4. The following exercises are also recommended:
    a. Stand in a dark room and switch a 100-watt light bulb on and off at intervals of ten seconds.
    b. While standing in daylight (preferably before 10 a.m. or after 4 p.m. when the sun is at a

slant) face direction of the sun and rotate the head from side to side, constantly blinking, and never looking directly at the sun. Try this exercise for no more than three minutes in the afternoon. As the eye muscles increase in strength, progressively increase the amount of time Until six minutes have been reached both morning and night. The exercise is not recommended for more than six minutes, twice a day. It is very important never to look directly at the sun, and should discomfort be experienced, the time period should be cut down. (Staring into the sun or staring at bright sources of light produces strain and should be avoided. In various eye diseases, such as glaucoma, detachment of the retina, iritis, it is advisable to abstain from sunning the eyes.) This exercise should be performed under the supervision of a qualified practitioner experienced in this type of therapy.

As another strengthening exercise for the eyes, face the sun with the eyes closed and slowly rotate the head from side to side. The warm, penetrating, and relaxing rays of the sun will strengthen and soothe the muscles of the eyes. This sunning of the eyes will also benefit upper and lower eyelids. It will also help overcome (in conjunction with dietary and systemic measures) sties, conjunctivitis, and blepharitis (inflammation of the eyelids—the authors).

From The Restoration of Health—Nature's Way by Edwin Flatto, N.D., D.O.

Article #5: Words Of Wisdom by Silvester Graham

WORDS OF WISDOM from LECTURES on the Science of Human Life by Sylvester Graham

1. In a limb which is habitually and vigorously exercised, the arteries become much larger, and the muscle more fully developed, than in the corresponding limb which is little employed; and, on the other hand, if the same limb be suffered to remain inactive for a considerable time, the size of the arteries will be much diminished.
2. The habitual exercise of our body or limbs, therefore, in any particular kind of employment, enables us to put forth more muscular power in that employment, or one requiring the action of the same muscles, than in any other. Hence, one individual may excel in the muscular powers of his arms, another in that of the lower limbs, and another in that of some other part, according to the nature of the regular employment of each.
3. Exercise of the cerebral organs certainly does increase their activity and vigor, and unquestionably also it increases to a certain extent their size or volume.
4. To keep up this grand vital circulation, to give to all the vital functions, to give perfectness to all the vital changes, and to secure a proper supply of blood to every part, and maintain the general health and energy of the system, EXERCISE, or voluntary action, is of the utmost importance. It greatly promotes circulation, and particularly in the capillary system, or the myriads of minute vessels which are so numerously distributed to every part of the body; it equally promotes respiration, causing full and deep inspirations of air, and a vigorous action of the lungs; and serves to impart vigor and activity to all the organs, and to secure the healthful integrity and energy of all the functions, and the symmetrical development and constitutional power of the whole system; and gives strength and agility and elasticity and grace to the body; and energy and activity to the intellectual and moral faculties. Indeed, exercise may truly be considered the most important natural tonic of the body. If it is wholly neglected, the body will become feeble, and all its physiological powers will be diminished; but if it is regularly and properly attended to, the whole system will be invigorated, and fitted for usefulness and enjoyment.

5. We have seen that every contraction of the muscles serves to exhaust their vital properties; and to replenish their exhaustion, a constant supply of fresh arterial blood is diffused throughout the muscular tissue in great abundance; and the more vigorously any part is exercised, the more rapidly and abundantly that part is supplied with arterial blood; and hence, the habitual, healthy, and vigorous exercise of any part, always serves to produce and maintain a full development of that part, and to give it greater power. Thus, if one arm is constantly and vigorously exercised, and the other remains wholly unemployed, the muscles of the former will soon be much more largely developed and far more powerful than those of the latter. Hence, the welfare of the whole system requires that each part should be duly exercised, and most especially in young and growing bodies, which are easily deformed and even dreadfully distorted by a neglect of voluntary action.
6. So far as voluntary exercise or labor is necessary to the most healthy condition and perfect functions of the human system, it is a blessing; and beyond that, it is in some measure an evil; for in proportion to the excess, life is always shortened, and the body predisposed to disease
   From constitutional necessity, therefore, if man takes too little voluntary exercise, he suffers; and if his voluntary exercise is excessive, he suffers. But happily for the race, the sufferings from excessive labor bear no proportion to those which result from inactivity. A man may greatly abbreviate his life by overtoiling, and yet through the whole of his earthly existence enjoy1 comparatively good health, sweet sleep and a cheerful mind; but he who suffers from want of exercise—and especially if with that is connected excessive alimentation and other dietetic errors —experience the bitterest and most intolerable of human misery.
7. ... The structure of society in civil life requires that many should be devoted to pursuits which are less favorable to health than the calling of the husbandman; and a large majority of these pursuits are of a nature which does not admit of sufficient active bodily exercise for health and comfort. To all such, therefore, exercise becomes a necessary part of regimen, and must be regularly attended to, or they must suffer. And yet, where it is mere matter of regimen, attended to because it cannot be neglected without suffering, it loses more than half its virtue. Exercise, in order to be most beneficial, must be enjoyed. The mind must enter into it with interest, and if possible with delight, losing the idea, of labor in that of pleasure.